



For Supervisor's use only

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90152



NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA



National Certificate of Educational Achievement  
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

## Level 1 Mathematics, 2003

### 90152 Solve right-angled triangle problems

Credits: Two

2:00 pm Wednesday 19 November 2003

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

Show ALL working.

If you need more space for any answer, use the pages provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

Achievement Criteria			For Assessor's use only
Achievement	Achievement with Merit	Achievement with Excellence	
Find unknowns in right-angled triangles. <input type="checkbox"/>	Find unknowns in practical situations involving right-angled triangles. <input type="checkbox"/>	Find unknowns in word or 3D problems. <input type="checkbox"/>	
Overall Level of Performance			<input type="checkbox"/>

You are advised to spend 30 minutes answering the questions in this booklet.

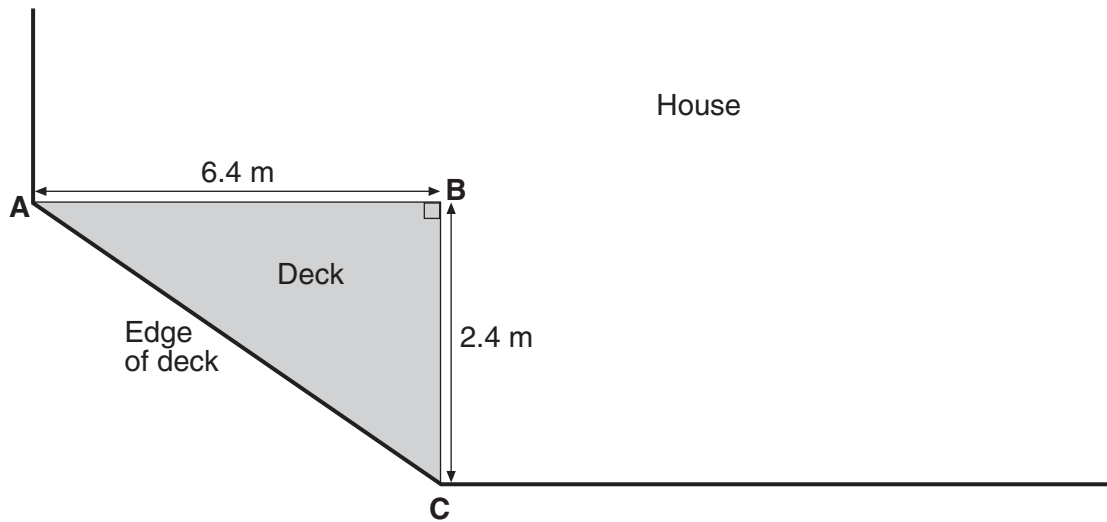
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## Home and Garden

Show **ALL** working.

### QUESTION ONE

Sophie has put a triangular deck at the front of her house, as shown in the diagram below.



- (a) Calculate the length of **AC**, the edge of the deck.

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- (b) Calculate the angle **BAC**, which the edge of the deck makes with the house.

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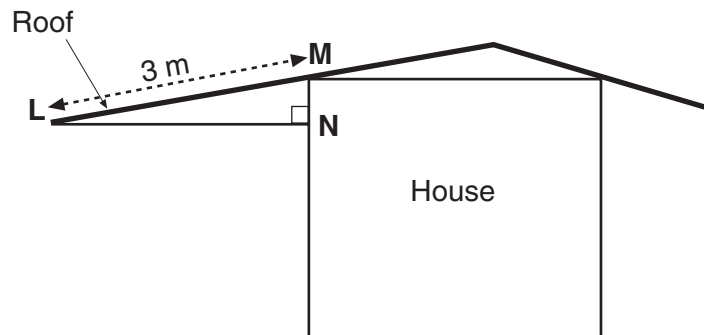
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- (c) **LM** is a 3 m extension of the roof of the house out over the deck. The roof makes an angle **LMN** =  $63^\circ$  with the wall of the house.

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Calculate the length **LN**, the distance of the edge of the roof from the house.

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## QUESTION TWO

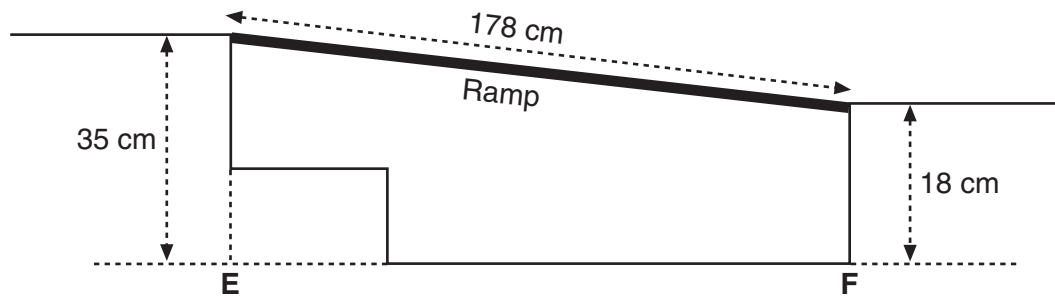
Sophie wants to alter a path at the back of the house.

At the moment, there are 2 steps down and 1 step up.

Sophie has decided to put a ramp straight across, as shown in the diagram below.

The new ramp will be 178 cm long.

The local council regulations state that the maximum angle that the ramp can make with the horizontal is  $5^\circ$ .



(Not to scale)

- (a) Will the ramp meet the council regulations?  
Show your working.

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- (b) Calculate **EF**, the horizontal distance between the edges of the two steps.

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### QUESTION THREE

A small stream goes across the back of Sophie's section.

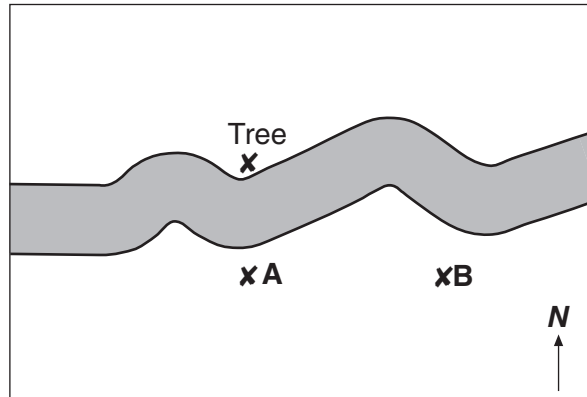
There is a tree on the bank on the far side of the stream.

The tree is due north of a point marked **A**.

Sophie wants to make a rope bridge that will go across the stream from **A** to the tree.

She has a 3 m long piece of rope.

She wants to know if her rope is long enough for the rope bridge.



Sophie puts a marker at **B**.

**B** is 4 m due east of **A**.

The tree has a bearing of  $303^\circ$  from **B**.

Is the rope long enough to make the bridge?

Show your working.

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## QUESTION FOUR

Sophie has been given a kitset for a shade house. A leaflet shows how the poles are assembled. There are 3 diagrams on the leaflet, as shown below.

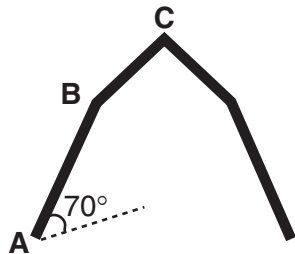


Diagram 1  
End view

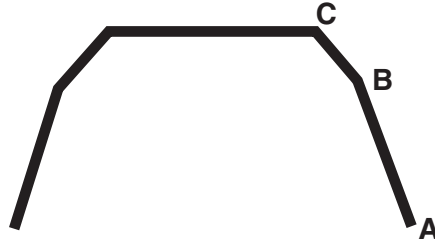


Diagram 2  
Side view

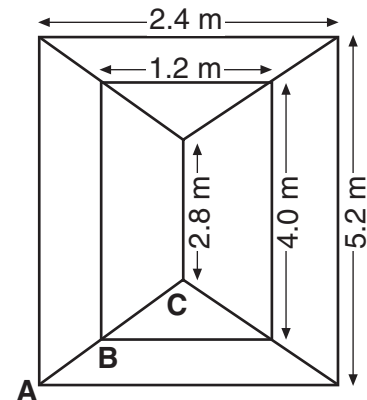


Diagram 3  
Top view

The leaflet also gives the following information:

- the angle **AB** makes with the ground is  $70^\circ$
- the angle between the poles **AB** and **BC** is  $164^\circ$ .

Before Sophie assembles the shade house, she wants to know its height.

Calculate the height of the shade house.

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**Extra paper for continuation of answers if required.  
Clearly number the question.**

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Question Number	Question	Answer
1	What is the main purpose of the study?	To investigate the effect of the new curriculum on the learning outcomes of the students.
2	What are the research objectives?	To determine the level of student achievement, to identify the factors affecting student achievement, and to compare the learning outcomes of the students in the experimental and control groups.
3	What is the research hypothesis?	The students in the experimental group will achieve higher learning outcomes than the students in the control group.
4	What is the research design?	Quasi-experimental design.
5	What are the variables in the study?	The independent variable is the new curriculum, and the dependent variable is the learning outcomes.
6	What is the sample size?	60 students.
7	What is the data collection method?	Tests and questionnaires.
8	What are the data analysis methods?	Descriptive statistics, t-test, and ANOVA.
9	What are the findings of the study?	The students in the experimental group achieved significantly higher learning outcomes than the students in the control group.
10	What are the conclusions and recommendations?	The new curriculum is effective in improving student learning outcomes. It is recommended that the new curriculum be implemented in all schools.

[illegible]

**Extra paper for continuation of answers if required.  
Clearly number the question.**

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Question Number	Question	Answer
1	What is the main purpose of the study?	To investigate the effect of the new curriculum on the learning outcomes of the students.
2	What are the research objectives?	To determine the level of student achievement, to identify the factors affecting student achievement, and to compare the learning outcomes of the students in the experimental and control groups.
3	What is the research hypothesis?	The students in the experimental group will achieve higher learning outcomes than the students in the control group.
4	What is the significance of the study?	The study is significant because it provides valuable information about the effectiveness of the new curriculum and the factors affecting student achievement.
5	What are the limitations of the study?	The study is limited by the sample size, the duration of the study, and the lack of control over external factors.
6	What are the conclusions of the study?	The study concludes that the new curriculum has a positive effect on the learning outcomes of the students, and that the factors affecting student achievement are the quality of the curriculum, the quality of the teaching, and the quality of the learning environment.
7	What are the recommendations of the study?	The study recommends that the new curriculum should be implemented in all schools, and that the factors affecting student achievement should be improved.

[illegible]